

a data processing device adapted for controlling valve pressure, flux viscosity, and flux spray pattern based on a configuration of the substrate and an arrangement pattern of conductive terminals thereon; and

a flux dispense nozzle configured for spraying flux on the conductive terminals, wherein the data processing device controls the flux viscosity in a range between about 10 centipoises and about 150 centipoises and controls the valve pressure for spraying the flux in a range between about 1.5 psi and about 30 psi.

22. (Twice Amended) The apparatus of claim 18, wherein the data processing device controls movement of the flux dispense nozzle in at least two dimensions relative to the substrate and decides a plurality of subsets based on the configuration of the substrate and the arrangement pattern of conductive terminals thereon, each subset comprising a plurality of conductive terminals closely located to each other.

REMARKS

At the time of the Final Office Action dated November 18, 2002, claims 1-18 and 22-30 were pending in this application. Of those claims, claims 18 and 22-30 have been rejected and claims 1-17 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b). Claims 18 and 22 have been ^{amended} ~~cancelled~~. Care has been exercised to avoid the introduction of new matter. Specifically, claim 18 has reintroduced the limitation that flux viscosity is in a range between about 10 centipoises and about 150 centipoises. As this concept was previously presented in original claim 18, Applicants submit that this amendment to claim

18 does not raise any new issue not already considered by the Examiner. Claim 22 has also been amended to introduce a limitation that was deleted from claim 18. Applicants submit that the present Amendment does not generate any new matter issue.

Applicants note that the Examiner has approved the proposed drawing correction submitted in the Amendment filed September 9, 2002. Although the Examiner has requested formal drawings, Applicants request that the requirement for formal drawings be held in abeyance until issuance of a Notice of Allowance, at which time, Applicants will submit formal drawings in accordance with customary Patent and Trademark Office practice.

Claims 18 and 22-30 are rejected under 35 U.S.C. § 103 for obviousness based upon Master et al., WO 99/48141 (hereinafter Master), in view of Stoops, U.S. Patent No. 5,615,828

On pages three through seven of the Office Action, the Examiner asserted that one having ordinary skill in the art would have been motivated to modify Master in view of Stoops "in order that a fine, thin jet of flux is obtained for effectively coating/filling the substrate." This rejection is respectfully traversed.

Applicants respectfully submit that the Examiner has failed to discharge the initial burden of establishing a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. § 103.¹ In particular, the Examiner has failed to provide a realistic motivation to modify the

¹ In re Mayne, 104 F.3d 1339, 41 USPQ2d 1451 (Fed. Cir. 1997); In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to identify a source in the applied prior art for: (1) claim limitations; and (2) the motivation to combine references or modify a reference in the reasonable expectation of achieving a particular benefit. Smiths Industries Medical System v. Vital Signs Inc., 183 F.3d 1347, 51

apparatus of Master in view of the teachings of Stoops.² The Examiner has also failed to establish that the applied prior art teaches all of the claimed limitations.

The only motivation to modify Master in view of Stoops that the Examiner asserted can be found in the first paragraph on page seven of the Office Action, in which the Examiner stated:

At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the teachings of Master et al with the teachings of Stoops in order that a fine, thin jet of flux is obtained for effectively coating/filling the substrate (see column 7 lines 19-21)

Column 7, lines 19-21 of Stoops only refers to orifice diameter, and as such, the Examiner has, at best, asserted some motivation to provide orifices in the range of 0.003" to 0.010" as taught by Stoops. The Examiner, however, has not established a motivation to modify Master in view of Stoops to provide, for example, a flux dispensing nozzle configured for spraying flux, which the Examiner admitted on page four of the Office Action is not disclosed by Master. The Examiner has also failed to establish a motivation to modify Master to arrive at the claimed valve pressure range. Thus, the Examiner has failed to establish a prima basis of obviousness for lack of the requisite motivation to combine Master in view of Stoops.

USPQ2d 1415 (Fed. Cir. 1999). In so doing, it is legally erroneous to ignore any claim limitation. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

² The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art to combine specific references to arrive at a specifically claimed invention. In re Deuel, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); In re Newell, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). The mere identification of claim features in disparate references does not establish the requisite realistic motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103. Grain Processing Corp. v. American-Maize Products Co., 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). Moreover, a generalization does not establish the requisite motivation to modify a specific reference in a specific manner to arrive at a specifically claimed invention. In re Deuel, *supra*. Rather, a burden is imposed upon the Examiner to identify a source in the applied prior art for each claim limitation and identify a source for the requisite realistic motivation to modify a particular reference in a particular manner to arrive at a specifically claimed invention. Smiths Industries Medical System v. Vital Signs Inc., *supra*; In re Mayne, *supra*.

The Examiner's rejection also fails to establish that the applied prior art teaches all of the claimed limitations. The Examiner asserts that on page four of the Office Action that:

Master et al does not teach an apparatus for dispensing flux including a flux dispense nozzle configured for spraying flux at a valve pressure between about 1.5 psi and about 30 psi to deposit the flux on the plurality of conductive terminals, wherein flux nozzle is a flux needle having an [sic] opening having a diameter range between 5 microns and 60 microns.

As the *Graham* factors require that the Examiner ascertain the differences between the prior art and the claims and the Examiner has not indicated any other features that were not taught by Master, Applicants can only assume that the Examiner is asserting that all the other claimed features are taught by Master.

The Examiner, therefore, must be asserting that Master teaches the claimed data processing device adapted for controlling valve pressure, flux viscosity, and flux spray pattern. Master, however, cannot teach a data processing device that controls valve pressure and flux spray pattern because Master teaches mechanically brushing flux onto the substrate. If the flux is mechanically brushed onto the substrate and not sprayed, the data processing device of Master cannot control valve pressure for spraying flux and the flux spray pattern. Furthermore, claim 18 also recites that the data processing device controls the flux viscosity to a range between about 10 centipoises and about 150 centipoises. As neither Master nor Stoops teaches or suggests this limitation, this limitation further distinguishes the claimed invention from the combination of Master and Stoops.

With regard to claim 26, which recites that an opening in a flux needle has a diameter in a range between about 5 microns and about 60 microns, the disclosure of 0.003" (77 microns) to 0.010" (256 microns) does not disclose the claimed invention. Although Applicants note the

Examiner's assertion that the claimed parameters are "[absent] superior or unexpected results," the Examiner is reminded that Applicants can assert "superior or unexpected results" as indicia of nonobviousness after the Examiner has established a prima facie case of obviousness. However, the alleged absence of superior or unexpected results is not an indicia of obviousness, but this point is moot, as the Examiner has failed to establish that the claimed range is obvious.

With regard to the claimed range in claim 26, the Examiner is also referred to M.P.E.P. § 2144.05 II(B), which is entitled "*Only Result-Effective Variables Can Be Optimized.*" As recognized by the courts, the Examiner must first establish that the parameter to be modified is an (a) art-recognized, (b) result-effective, (c) variable prior to asserting that the limitations as to the parameter would have been obvious.³ As (c) implies, the limitation must be variable. As such, the disclosure of a value or range does not establish that the term is variable. There must be some teaching that the limitation can vary from the taught value or range. Pertaining to (b), the Examiner must establish that the prior art gives one having ordinary skill in the art a reason to optimize this variable (i.e., varying the limitation in one direction or another produces an expected desirable result). In this regard, the Examiner must go beyond establishing that varying the limitation produces some random result. A random result is not enough; instead, the result must be recognized by the prior art as desirable. With regard to (a), the parameter to be optimized being result-effective and variable must be recognized by the art. The Examiner, however, has failed to establish that the claimed diameter of an opening in a flux needle is an art-recognized, result effective, variable. Thus, the Examiner cannot assert that optimizing this parameter would have been obvious to one having ordinary skill in the art.

³ See, In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); In re Yates, 663 F.2d 1054, 211 USPQ 1149 (CCPA 1981); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

For the reasons stated above, Applicants, therefore, respectfully submit that the imposed rejection of claims 18 and 22-30 under 35 U.S.C. § 103 for obviousness predicated upon Master in view of Stoops is not viable and, hence, solicit withdrawal thereof.

Claims 18, 22-24 and 27-30 are rejected under 35 U.S.C. § 103 for obviousness based upon Master in view of Napor et al., U.S. Patent No. 3,741,150 (hereinafter Napor)

On pages seven through ten of the Office Action, the Examiner asserted that one having ordinary skill in the art would have been motivated to modify Master in view of Napor "in order that a fine, thin jet of flux is obtained for effectively coating/filling the substrate." This rejection is respectfully traversed.

Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claims 18 and 22-30 under 35 U.S.C. § 103 for obviousness based upon Master in view of Stoops. Specifically, many of the features that the Examiner asserts are taught by Master (i.e., data processing device adapted for controlling valve pressure, flux viscosity, and flux spray pattern) are not taught by Master.

Furthermore, the Examiner's proposed motivation to modify Master in view of Napor is nothing more than an overreaching generality. It has been repeatedly held by the Federal Circuit that in order to establish the requisite motivation, the Examiner must make "clear and particular" factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify a particular prior art

reference to arrive at the claimed invention based upon facts, not generalizations.⁴ In so doing, the Examiner must provide facts and explain why one having ordinary skill in the art would have been realistically motivated to modify the flux dispenser of Master in view of the teachings of Napor to arrive at the claimed invention.⁵ That burden has not been discharged.

Instead, the Examiner has overreached by asserting that the teachings of Napor would somehow improve upon the flux conservation ability of Master by providing precisely controlled and positioned flux patterns. Applicants respectfully submit that one having ordinary skill in the semiconductor industry at the time of the invention would not have considered a statement regarding the flux dispenser of Napor being "precisely controlled," absent any supportive facts, as being an accurate comparison of the flux dispenser of Napor relative to current flux dispensers, such as the flux dispenser of Master. For these reasons, the Examiner has failed to establish that one having ordinary skill in the art would have been motivated to modify the teachings of Master in view of the teachings of Napor. Applicants, therefore, respectfully submit that the imposed rejection of claims 18, 22-24 and 27-30 under 35 U.S.C. § 103 for obviousness predicated upon Master in view of Napor is not viable and, hence, solicit withdrawal thereof.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

⁴ Ruiz v. A.B. Chance Co., 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); Ecolochem Inc. v. Southern California Edison, Co., 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); In re Kotzab, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); In re Dembiczak, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999).

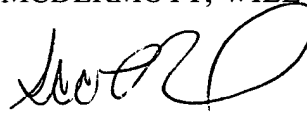
⁵ Ecolochem Inc. v. Southern California Edison, Co., supra.; In re Rouffet, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

Applicants have made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicants hereby respectfully request reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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